

Francesca Germano and Madeline Mathers
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The Presence of Microplastics in Cayuga Lake

The presence of microplastics has become a pressing environmental and ecotoxicological issue in the recent years. Microplastics are formed as a result of degrading single use plastics, self-care products, and more. Because of this degradation over long periods of time in the environment, the plastics begin to break down into pieces so small the human eye cannot detect them. Because these fragments are so microscopic, they are too small to be filtered through waste water treatment plants- thus they become able to enter our waterways, soils and ecosystems. Other studies and research have found there is a negative correlation between microplastic presence and health of aquatic ecosystems. Our research, facilitated by Dr. Susan Allen-Gil of the Environmental Studies Department, addresses the presence of these microplastics in our very own Cayuga Lake. The objective of this experiment is to evaluate the quantity and frequency of microplastics from different locations on Cayuga Lake. With this information, we hope to understand the toll microplastics are taking on our local environment, and to anticipate the consequences the community will have to face because of them. In our research, many different samples have been taken, and will continue to be taken from multiple locations on Cayuga Lake. The samples are collected through a net and filter constructed by Susan Allen-Gil, that has a screen small enough to filter microplastics through it. At the bottom of the net, there is a cylindrical filter that will trap microplastics in the bottom of it. The organic matter and water are then bottled and refrigerated to await digestion. After this collection, the samples are all individually digested with hydrogen peroxide, stained with Nile Red dye and then vacuum filtered in order to remove all organic matter from the sample. After the digestion process, all samples are logged, photographed and counted under a microscope. The Nile Red dye is used in this process in order to allow inorganic material to reflect light under the microscope. Through our research thus far, we have found evidence of inorganic material in these samples that we believe to be microplastics, and continue to find more as sample digestion continues. The possibility to back calculate all of our samples in order to determine how many microplastics there are in all of the lake also could present itself as well. Our hope with our research is to continue accounting for microplastics in Cayuga Lake in order to bring awareness to the detriment microplastics can have on aquatic ecosystems and hopefully encourage the disuse of plastic products in our community.